CS 485 Data Communications and Network
SYLLABUS

CLASS MEETING TIMES
Semester: Fall 2024
Section: CS485-01
Course Delivery Mode: Face-to-Face
Class Hours: 02:00-03:20 pm Tuesday & Thursday.
Classroom: Warehouse B Room 3

INSTRUCTOR
Name: Dr.Byoungyong Lee
Office: Warehouse B Room 4
Phone: 671-735-2831
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Office Hours: Mon/Wed: 08:30 am – 09:30 am / 12:30 pm – 01:00 pm
Tue/Thu: 11:00 am – 12:00 pm / 03:30 pm – 04:00 pm

COURSE DESCRIPTION
This course is a study of the theory of computer networking focusing on the TCP/IP Internet protocols and covering the five layers: physical, data link, network, transport, and application. The course covers communication on wired, wireless, and cellular networks. The course introduces secure communication and its incorporation into different layers of the model.

PREREQUISITES
CS 385 Introduction to Operating System

SKILLS & BACKGROUND REQUIRED OR EXPECTED
Knowledge and skills obtained from the prerequisites:
Basic concept of computer organization and programming skill

REQUIRED TEXTBOOK, EQUIPMENT, AND/OR READINGS:
Textbook
James F. Kurose, Computer Networking (8th Ed) 2021, Pearson

Reference
Behrouz A. Forouzan, Data Communications and Notworking with TCP/IP protocol suite (6th ed) 2022, McGrawHill
Andrew S. Tanenbaum, Nick Feamster, David Wetherall, Computer Networks (6th ed) 2021, Pearson

RATIONALE FOR COURSE

The Internet and computer networks are now ubiquitous and a growing number of computing activities strongly depend on the correct operation of the underlying network. Networks, both fixed and mobile, are a key part of the computing environment of today and tomorrow. Many computing applications that are used today would not be possible without networks. This dependency on the underlying network is likely to increase in the future. This course covers the knowledge bodies that are specified in the ACM/IEEE Computer Science Guide 2013 as required for the computer science major.

COURSE FORMAT

Classes consist of lectures, paper-pencil problem solving and discussion, and presentations.

STUDENT WORKLOAD

Spend an average of at least 2–3 hours studying for every class, 1-2 hours for each lab assignment, and 2 – 3 weeks for project

GRADING SYSTEM/EVALUATION METHODOLOGIES

Course Requirements	Percent (%)
Attendance	10%
Homework	15%
Presentation	15%
Projects	15%
Midterm Exam	20%
Final Exam	25%
Total	100%

Letter grades will be assigned per the UOG Catalog:

A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	0 – 59%

Homework

Reading assignment and/or problem sets will be given from the textbook and other instructional materials.

Presentation

Students form groups of 2 to 3 members and present group assignments.

Projects

1~2 projects will be given, and projects will be team or individual projects.

Midterm Exam: Comprehensive

Final Exam: Comprehensive

COURSE TOPIC/EXAM SCHEDULE

Week	Topic	
1- 3	Chapter 1: Computer Networks and the Internet.	
4 - 5	Chapter 2: Application Layer	
6 - 7	Chapter 3: Transport Layer	
8	Chapter 4: The Network Layer: Data Plane	Midterm Exam
9	Fall Break	
10	Chapter 4 : The Network Layer: Data Plane	
11-12	Chapter 5: The Network Layer: Control Plane	
13-15	Chapter 6 : The Link Layer and LANs	
16-17	Chapter 7: Wireless and mobile Networks	
18		Final Exam

STUDENT LEARNING OUTCOMES (SLOs)

This course covers the following ACM/IEEE CC2013 Body of Knowledge student learning outcomes:

- **NC/Introduction**
- **NC/Networked Applications**
- **NC/Reliable Data Delivery**
- **NC/Routing and Forwarding**
- **NC/Local Area Networks**
- **NC/Resource Allocation**
- **NC/Mobility**
- **NC/Local Area Networks**
- **NC/Resource Allocation**
- **NC/Mobility**

Mapping to Program Learning Outcomes and Institutional Learning Outcomes.

CS 485 Student Learning Outcomes (SLO)	Program Learning Outcomes (PLO)*	Institutional Learning Outcomes (ILO)*	Activities/Assessments
1, 2	1	1	Test, Final Exam
5	2	1	Assignment, Project
4	3	3	Test, Final Exam, Project
9	5	4	Project
7	6	6	Assignment, Project
* Refer to PLO's and ILO's described hereafter			

Student Learning Outcomes:

SLO-1. Articulate the organization of the Internet. [Familiarity]

SLO-2. Compare and contrast

    a. current approaches to congestion. [Assessment]

    b. fixed and dynamic allocation techniques. [Assessment]

SLO-3. Define the principles behind naming schemes and resource location. [Familiarity]

SLO-4. Describe

    a. how frames are forwarded in an Ethernet network. [Familiarity]

    b. how packets are forwarded in an IP network. [Familiarity]

    c. how wireless networks support mobile users. [Familiarity]

    d. the congestion problem in a large network. [Familiarity]

    e. the differences between IP and Ethernet. [Familiarity]

    f. the interrelations between IP and Ethernet. [Familiarity]

    g. the layered structure of a typical networked architecture. [Familiarity]

    h. the operation of reliable delivery protocols. [Familiarity]

    i. the organization of a wireless network. [Familiarity]

    j. the organization of the network layer. [Familiarity]

    k. the steps used in one common approach to the multiple access problem. [Familiarity]

SLO-5. Design and implement a simple reliable protocol. [Usage]

SLO-6. Identify the different types of complexity in a network (edges, core, etc.). [Familiarity

SLO-7. Implement a simple client-server socket-based application. [Usage]

SLO-8. List

    a. the appropriate network terminology. [Familiarity]

    b. the differences and the relations between names and addresses in a network. [Familiarity]

    c. the factors that affect the performance of reliable delivery protocols. [Familiarity]

    d. the scalability benefits of hierarchical addressing. [Familiarity]

SLO-9. Develop teamwork and leadership skills through team project and collaborative learning

CS Program Learning Outcomes (PLOs)

PLO-1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

PLO-2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

PLO-3. Communicate effectively in a variety of professional contexts.

PLO-4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

PLO-5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

PLO-6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

UOG Institutional Student Learning Outcomes (ILOs)

ILO-1. Critical thinking and problem solving

ILO-2. Mastery of quantitative analysis

ILO-3. Effective oral and written communication

ILO-4. Understanding and appreciation of culturally diverse people, ideas and values a democratic context

ILO-5. Responsible use of knowledge, natural resources, and technology

ILO-6. An appreciation of the arts and sciences

ILO-7. An interest in personal development and lifelong learning

COURSE POLICIES

Assignment
- Late labs and homework assignments with receive late penalties.

Midterm and Final Exam
- There are no make-up exams, unless with the consent of the instructor.

Attendance : Class attendance is mandatory.

Regular and punctual class attendance is expected of all students. Student must accept the consequences of failure to attend. Instructor will drop a student from the course for excessive absences. "Excessive absences" means failure to attend 70% of scheduled class meetings. A student missed more than 30% of scheduled classes will be dropped from the course and will receive a failing grade F. A student so dropped may appeal through the college's Due Process.

Note: Student who arrives after the instructor starts a class will be considered as tardy. 3 tardy will be counted as 1 unexcused absence.

A course for which a student registers and does not attend and is not officially dropped will be recorded as an "F" grade on the student's record. All students (including those who enroll in classes late) are responsible for the work covered and assigned from the first meeting of a class.

ACADEMIC DISHONESTY

Academic Integrity is about performing in your role as a student in ways that are honest, trustworthy, respectful, responsible, and fair (see www.academicintegrity.org for more information). As a student, you will complete your academic assignments in the manner expected by the instructor. Academic dishonesty, including but not limited to cheating and plagiarism may result in suspension or expulsion from the University. Refer to the UOG Student Handbook and Code of Conduct for more information.

Professional and ethical conduct is expected at all times. Unethical conduct includes any form of cheating, including plagiarism. The term "**cheating**" includes, but is not limited to: (1) use of any unauthorized assistance in taking quizzes, tests, or examinations, e.g., looking at other students' answers, using crib notes (including electronic), getting information from another person via any kind of communication; (2) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; or (3) the acquisition, without permission, of tests or other academic material belonging to a member of the University faculty or staff. If you need to use an electronic translator, you must discuss this with me in advance. All assignments and tests must be your own work. Answers you write on the tests must come only from in your head or the information supplied in the test papers; anything else is cheating. Any evidence of cheating will result in a "0" for those assignments and/or exam or possibly an "F" for the entire course – final decision to be determined by me, the course instructor.

FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT (FERPA)

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights for students, parents and school officials can be viewed at: **http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html**

UOG DISABILITIES POLICY

In accordance with the Americans with Disabilities Act (ADA) of 1990 and the Rehabilitation Act of 1973, the University of Guam does not discriminate against students and applicants on the basis of disability in the administration of its educational and other programs. The University offers reasonable accommodations for a student or applicant who is otherwise qualified, if the accommodation is reasonable, effective and will not alter a fundamental aspect of the University's program nor will otherwise impose an undue hardship on the University, and/or there are not equivalent alternatives. Students are expected to make timely requests for accommodation, using the procedure below.

ADA Accommodation Services

For individuals covered under the ADA (Americans with Disabilities Act), if you are a student with a disability requiring academic accommodation(s), please contact the Disability Support Services Office to discuss your confidential request. A Faculty Notification letter from the Disability Support Services counselor will be provided to me. To register for academic accommodations, please contact or visit Sallie S. Sablan, DSS counselor in the School of Education, office 110, disabilitysupport@triton.uog.edu or telephone/TDD 671-735-2460.

TOBACCO-FREE/SMOKE-FREE/VAPING FREECAMPUS

UOG is a tobacco-free/smoke-free, vaping/e-cigarette free campus. Thank you for not using tobacco products on campus, and for helping make UOG a healthy learning and living environment. For more information visit: http://www.uog.edu/smoke-free-uog